

Canine Oral Malignant Melanoma

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Neoplasia is an all too common finding in domestic animals. The oropharyngeal cavity is a common site for the development of tumors, particularly in dogs. One such tumor is oral malignant melanoma which occurs with some frequency in dogs but is rare in cats.¹ Hence, the following shall focus on canine malignant melanoma.

Case Study

"Capricorn," a nine year old spayed female cocker spaniel, was first presented in November 1989 for a dental prophylaxis. The owner reported no health problems at the time of presentation. During induction of anesthesia, a mass was detected in the oral cavity.

The mass was darkly pigmented and approximately 1 cm in diameter. It was attached via a thin 1 mm diameter pedicle to the lower right gingiva lateral to the third premolar and 5 mm ventral to the gum line. The mass was causing no obvious discomfort; however, the owner elected to have it surgically removed after completing the dental prophylactic procedure.

Based primarily on gross appearance, the primary differential was oral malignant melanoma. Therefore, prior to removal, neither a biopsy nor needle aspirate were performed. Thoracic radiographs were not taken to evaluate the extent of underlying bone involvement or distant metastasis.

Due to the small attachment area and location within the mouth the mass was removed with approximately 2 mm margins, leaving the mandible intact. The mass was then submitted to the Iowa State University

Veterinary Diagnostic Laboratory for histologic examination, confirming a diagnosis of oral malignant melanoma. Surgical clearance at the margins was incomplete. The owner was notified of the findings and given a guarded prognosis for long-term survival due to the possibility of local recurrence and distant metastasis.

"Capricorn" died three years following the initial diagnosis of oral malignant melanoma. Necropsy detected neoplasia of the liver with no apparent local recurrence of the oral malignant melanoma. The owner declined further evaluation of the neoplastic liver.

Incidence and Prevalence

The oropharyngeal cavity is a prominent site for tumor development. The oral cavity is the fourth most common site of neoplasia in the dog.² Approximately 6.6% of all canine benign and malignant neoplasms occur in the oral cavity, most often originating from the buccal mucosa, tongue, periodontium, mandible, maxilla, and lips.² The gingiva, particularly covering the molars, is the most common site for oral malignant melanoma development.³ Tumors of the oral cavity, regardless of tumor site, are frequently malignant and represent approximately 5.3% of all canine malignant tumors.¹

Malignant melanoma is the most common canine malignant oral neoplasm. A retrospective study reported the incidence in a defined canine population to be 20.4 cases per every 100,000 dogs per year.⁴ It is 2.5 times more frequent in dogs than cats.¹ Breeds reportedly predisposed to tumor development include cocker spaniels, golden retrievers, Labrador retrievers and breeds with darkly pigmented mucosa.^{2,5} In one study, dachshunds and beagles were at a significantly

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lower risk at developing oral malignant melanoma.⁶ Malignant melanoma occurs most frequently in older male dogs, aging 10.1 to 11.5 years.^{2,6} Based on the reported incidence and signalment, oral malignant melanoma is a likely cause of "Capricorn's" tumor.

Clinical Signs

As is the case with many diseases, the clinical signs of oral malignant melanoma at the time of presentation are variable and non-pathognomonic. Some of the more commonly reported signs are persistent or recurrent oral hemorrhage, oral pain or a reluctance to chew.² Additional signs include displacement or loss of teeth, halitosis, excessive salivation, facial deformity, dysphagia, excessive licking, and psychogenic polydipsia.^{2,3} Often the only clinical sign reported by the owner is the presence of a mass in the oral cavity causing no apparent problems, as was the case with "Capricorn." Although none of the aforementioned clinical signs are themselves diagnostic, each is strongly suggestive of an abnormality involving the oral cavity and requires further investigation.

Diagnosis

While not the only oral tumor in dogs, malignant melanoma is the most common. Other differential diagnoses include squamous cell carcinoma, fibrosarcoma, and epulides.² It is impossible to rely on gross appearance alone to obtain a definitive diagnosis as these tumors may all look similar. Oral malignant melanomas range from amelanotic to heavily pigmented; however, most veterinarians associate melanoma with the pigmented form, which aids in diagnosis.²

Several routine procedures are recommended to assist in obtaining a diagnosis. A complete blood count, serum biochemical analysis, and urinalysis are important to determine overall patient health.² In addition, initial evaluation of an oral mass should

include measurement of the tumor size, palpation of regional lymph nodes, and a fine needle aspirate and cytologic examination of any enlarged lymph nodes.²

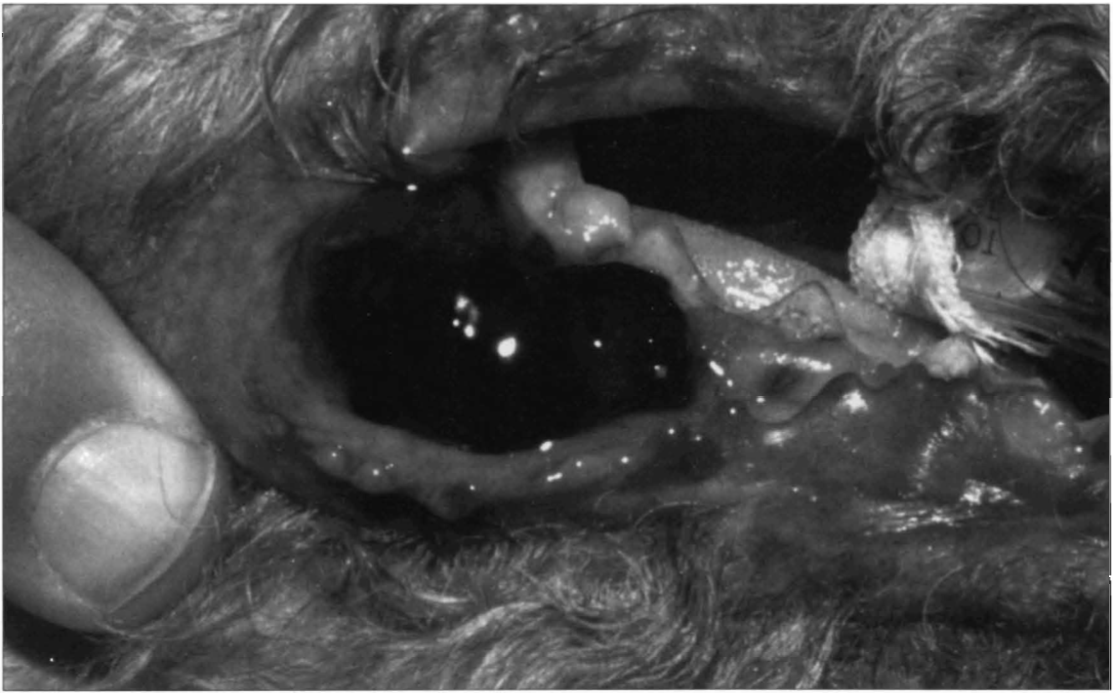
Radiographs of the skull and thorax are important to assess the extent of local tumor invasion and distant metastasis. Skull radiographs should be evaluated for abnormalities associated with the mass such as bone lysis or new bone production. The most useful views are open mouth dorsoventral or intraoral views of the mandible and maxilla, and oblique lateral projections of the mandible (to visualize each hemimandible individually). Standard right and left lateral and dorsoventral views of the thorax are useful to evaluate the lung fields for metastatic tumor development.²

When available, computed axial tomography or magnetic resonance imaging are useful in defining the area and extent of neoplastic involvement.² However, these are not as frequently done due to the expense and lack of availability.

By far, the most reliable means of diagnosis and differentiation of tumor type is histologic examination of a biopsy sample or fine needle aspirate.² The diagnostic, microscopic feature of oral malignant melanoma is the presence of melanocytes (as melanomas appear to develop from melanocytes in the oral epithelium).⁷ Histologic identification also relies upon cell shape and nuclear position.⁵ Melanomas are usually composed of intraepithelial nests of polyhedral epithelial-like cells that contain abundant granular cytoplasm, large hyperchromatic or vesicular round nucleoli, and are arranged in irregular lobules separated by strands of collagen.⁵ The histologic examination allows for differentiating oral malignant melanoma from other oral tumors. Without histologic examination, only a presumptive diagnosis can be made.

Treatment

The methods of treating oral malignant melanoma are numerous. The traditional forms of treatment include radical surgical



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resection, radiation therapy, cryosurgery, chemotherapy, and hyperthermia.⁸ The choice of treatment method encompasses the desires of the owner, capabilities of the clinic, expense and cosmetic results.

Of the traditional forms, early radical surgical excision remains the foundation of therapy for most benign and malignant oral tumors.² Hemimandibulectomy or hemimaxillectomy are often the procedure of choice. Resection of the tumor requires a minimum 1 cm margin of healthy tissue to decrease the likelihood of local recurrence.² Management, however, of oral malignant melanoma is complicated by the close association with bone and the lack of mobile soft tissues within the mouth. This leads to a difficulty in achieving complete excision of the tumor.³ Closure is limited by the amount of labial mucosa available.⁹

In general, radical surgical resection is tolerated well by most dogs and has few post-surgical complications. The most common postoperative complications are anemia and suture line dehiscence. Other complications include drooping of the tongue, sublingual edema, and mandibular drift.⁹

Other forms of therapy are less success-

ful. The response to radiation therapy is poor for oral malignant melanoma. Hyperthermia alone is ineffective and is used primarily to complement radiation therapy. Chemotherapy is usually ineffective. Cryosurgery is often used only as a palliative measure for nonresectable tumors.² Although ineffectual alone, the above have prolonged remission time and survival when used as adjuvant therapy with radical surgery.⁵

A possible alternative treatment to traditional forms is the use of local, sustained release chemotherapy by use of intralesional cisplatin implants.⁸ The implant is an injectable viscous gel composed of a protein carrier matrix, a vasoactive modifier (epinephrine) and a chemotherapeutic drug (cisplatin). This treatment modality enhances the concentration of the active drug in the tumor while minimizing adverse systemic effects. In one study, 70% of dogs with melanoma had a 50% decrease in tumor volume with 50% obtaining complete remission following an average of two treatments. Systemic toxicosis was minimal and renal insufficiency was not evident; however, local necrosis at the treatment site developed in 17 of 20 dogs. The results of this study are encouraging

and warrant further research.

Despite the recommendation for radical surgical excision, conservative excision is often the treatment chosen. Treatment by radical surgical excision results in longer remissions and survival times than does conservative excision.⁵ Surprisingly, "Capricorn" did well with conservative excision and incomplete surgical clearance. Fortunately, local tumor recurrence was not evident. Tumors that do reoccur are often not successfully managed by additional surgery or radiation.³ Consequently, radical excision is still recommended to remove the entire tumor initially.

Progression

The progression of tumor development can be surprisingly fast. Oral malignant melanoma begins in the oral epithelium and is characterized by rapid growth, local invasiveness and early metastasis.⁷ At the time of diagnosis, 57% of dogs have detectable bone involvement and 14% have detectable pulmonary metastasis.⁴ Lymph node metastasis occurs in 57% to 74% of dogs while distant metastasis occurs in 47% to 67% of dogs.⁴ The above explains the necessity for early aggressive treatment if long-term survival is expected.

Prognosis

Clinical staging of oral tumors is a means of determining disease progression and ultimately prognosis. Clinical staging of the patient is based on several categories: size and degree of primary tumor involvement, regional lymph node involvement and evidence of distant metastasis.

In general, a guarded to poor prognosis is invariably assigned to cases of oral malignant melanoma. The poor prognosis is the result of the debilitation from local infiltrative disease or systemic metastasis.⁸ Post-surgical recurrence and distant metastasis are common in oral malignant melanoma.⁷ Several studies have determined the average survival time to range

from 3 to 9 months following radical surgery with few surviving greater than 1 year.^{3,9} Without surgery the survival time decreased to an average of 2 months.⁹ Understandably, with such short survival times a guarded to poor prognosis is appropriate for "Capricorn".

Conclusion

Oral malignant melanoma is a relatively common finding for the small animal practitioner. The signalment and clinical signs presented are guidelines to aid in diagnosis. Diagnosis relies upon physical examination, skull radiographs, and microscopic examination of the tumor. To obtain the best results for prolonged survival and improved quality of life, early radical surgical excision is recommended. Poor survival time supports the need for further research in discovering an improved treatment modality with more acceptable results. V

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